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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/932,531	08/17/2001	Douglas W. Akers	B-124	4276

7590 11/17/2003

Alan D. Kirsch
Bechtel BWXT Idaho, LLC
P. O. Box 1625
Idaho Falls, ID 83415-3899

EXAMINER

PALABRICA, RICARDO J

ART UNIT	PAPER NUMBER
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3641

DATE MAILED: 11/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/932,531

Applicant(s)

AKERS

Examiner

Rick Palabrica

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 September 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 1-5, 7, 8, 20-24, 26-28 and 30-36 is/are pending in the application.
- 4a) Of the above claim(s) 4 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5, 7, 8, 20-24, 26-28 and 30-36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

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DETAILED ACTION

1. Applicant's amendment in Paper No. 16, which amends claims 1, 8, 20-22, 24, 26, 28 and 30-36, is acknowledged. This amendment is in response to the 6/26/03 Office Action.
2. Applicant agrees that the substitution of the limitation, "the presence or absence of a lattice defect" for the term, "lattice characteristic" overcomes the rejection of associated claims based on the applied art of Pongratz (U.S. 5,175,756) or Miller (U.S. 4,980,901). However, said amendment is still insufficient to overcome prior art, as discussed below.
3. Applicant traversed the rejection of claims 26-28 under 35 U.S.C. 112, 1st and 2nd paragraphs. Applicant's arguments have been fully considered but they are not persuasive because these arguments actually affirm rather than contradict the examiner's basis for rejection.

As stated in section 7 of the 6/26/03 Office Action, the examiner rejected said claims because of the claim language, "means for activating a positron emitter." The examiner stated that it is not the positron emitter that is activated but rather it is the precursor of the positron emitter that is activated. The activation of the precursor, e.g., by photon bombardment, converts the precursor to a positron emitter.

Applicant cites the specification in paragraph 0020 in his traverse. This paragraph states, "One way for producing positrons involves the decay of neutron-

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deficient isotopes. In the present invention, the photons 16 from the photon source 12 produce such neutron-deficient isotopes within the specimen 18 by removing "knocking-off" neutrons from atoms within the specimen 18. The neutron-deficient isotopes (referred to herein in the alternative as "positron emitters") then decay into non-neutron deficient atoms by the emission of positrons and neutrinos." The positron emitters are the neutron-deficient isotopes. These neutron-deficient isotopes are produced by bombardment of photons that remove neutrons from atoms within the specimen. These atoms from which neutrons are removed must be atoms that not neutron deficient, otherwise there will be no need for said neutron-removal process. These atoms that are not neutron deficient are the "precursors" referred to by the examiner. When a precursor is hit by a photon, the precursor is activated (i.e., made radioactive) because of the transfer of energy from the photon to the precursor. The activated precursor then gets rid of excess energy, for example, by emitting a neutron (a process known in the art as a photonuclear reaction). Such neutron emission results in a neutron-deficient isotope that subsequently decays by positron emission. Thus, it is the precursor that is activated to form a positron emitter, which is inherently unstable. The unstable positron emitter emits positrons without requiring "activation".

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

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The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 26-28 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The reasons for the rejection are the same as those given in section 7 of the 6/26/03 Office Action, as further clarified in section 3 above.

5. Claims 26-28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims are vague, indefinite and misdescriptive for the reasons cited in section 7 of the 6/26/03 Office Action, as further clarified in section 3 above.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-3, 5, 7 and 8 rejected under 35 U.S.C. 103(a) as being unpatentable over Akers et al. (U.S. 6,178,218 B1) in view of Richard B. Firestone, "The Berkeley Laboratory Isotopes Project, Exploring the Table of Isotopes," (<http://ie.lbl.gov/education/isotopes.htm>). Akers et al. disclose the applicant's claims except for the use of a photon source.

Akers et al. disclose an apparatus and method for performing nondestructive examination of a metal specimen using neutron activated positron annihilation. The positron emitter source is formed within the metal specimen by neutron activation and the gamma rays from positron annihilation are detected by a Ge or Ge(Li) detector (see Abstract and Figs. 1 and 2). Applicant's claim language. "data processing system producing data indicative of the presence or absence of a lattice defect in the specimen being tested" reads on the Canberra Inspector multichannel analyzer system used with the detector (see column 5, lines 27+).

Akers et al. disclose an exemplary embodiment in Fig. 1 wherein the specimen is an aluminum alloy that is activated by a neutron source 12. Activation of copper atoms in the specimen produces positron emitters, including ^{64}Cu and ^{62}Cu . They disclose that ^{62}Cu is produced from an (n,2n) reaction in ^{63}Cu .

Richard B. Firestone, "The Berkeley Laboratory Isotopes Project, Exploring the Table of Isotopes," teaches that ^{62}Cu can be produced by any one of: a) charged particle reaction; b) photon reaction; or c) fast neutron activation (click on Cu on the Periodic Table of Elements to view Production Mode). Applicant's claim language,

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"photon source" reads on the expedient to generate the photons and effect the photon reaction taught by Firestone.

Therefore, it would have been obvious to one having ordinary skill of the art at the time the invention was made to modify the apparatus, as disclosed by Akers et al., by the teaching of Firestone, to gain the advantages thereof (e.g., less unwanted activation products), to substitute a photon source for a neutron source, as this is no more than the substitution of one technique for production of a positron emitter such as ^{62}Cu , by another well-known technique of producing the same radioisotope.

Note that the it is immaterial how the ^{62}Cu is produced because it will emit positrons whether it is produced by either neutron or photon activation.

7. Claims 20-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Akers et al. and Richard B. Firestone, and in view of applicant's own admission of prior art on page 12 of Paper No. 14 (rapid activation/analysis process), on page 9 of Paper No. 14 (normal activation/analysis process), the specification on page 28 (on Doppler broadening algorithm), on page 29 (positron lifetime algorithm), and on page 30 (three dimensional imaging algorithm). The combination of Akers et al. and Richard B. Firestone disclose the applicant's claims except for specifics on the data processing system operation.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus, as disclosed by the

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combination of Akers et al. and Richard B. Firestone, to include a data processing system that operates on a normal activation/analysis process when a half life of a selected positron emitter is greater than a predetermined half life and on a rapid activation/analysis process when a half life of a selected positron emitter is less than a predetermined half life, as well as including a positron lifetime algorithm, selective activation algorithm, and three dimensional algorithm to gain the advantages thereof (i.e., more accurate results), because such modification is no more than the use of well-known expedients within the nuclear art.

8. Claims 26, 27, 28 and 30-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Akers et al. and Richard B. Firestone, in view of applicant's own admission of prior art in the specification on page 28 (on Doppler broadening algorithm), page 29 (positron lifetime algorithm), on page 30 (three dimensional imaging algorithm), on page 12 of Paper No. 14 (rapid activation/analysis process), and page 9 of Paper No. 14 (normal activation/analysis process).

Note that the combination of Akers et al. and Richard B. Firestone inherently has means for activating a positron emitter because the photons produced in their apparatus continue to bombard the precursor-produced positron emitters after they are formed.

Claims 26, 31, and 36 recite the use of a Doppler broadening algorithm in the data processing system. Claims 27, 28, 33, 34 and 36 recite the use of a positron lifetime algorithm in the data processing system. Claims 32, 35, and 36 recite the use of a three-dimensional imaging algorithm in the data processing system. The admitted

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prior art indicates that the use of such counting techniques and algorithms is already known in the positron annihilation art. Therefore, the use of such well-known counting techniques and algorithms for the combination of Akers et al. and Richard B. Firestone is prima facie obvious.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rick Palabrica whose telephone number is 703-306-5756. The examiner can normally be reached on 7:00-4:30, Mon-Fri; 1st Friday off.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Carone can be reached on 703-306-4198. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1113.

RJP
November 10, 2003

A handwritten signature in black ink is written over a rectangular stamp. The stamp contains the text "RECEIVED" and "NOV 10 2003".